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BROMEGRASS

Use and Culture on Ohio Farms

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Bromegrass—Use and Culture on Ohio Farms

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To most people, bromegrass is a new grass, although it has been known and tested in this country more or less for more than 50 years. Bromegrass is commonly known as "smooth bromegrass" and botanically as *"Bromus intermis."* The use of bromegrass is spreading rapidly. From Ohio west to the Rockies and also farther East it is being used more and more as a long-lived drouth-resisting pasture grass in combination with alfalfa. It is a native of eastern Europe. It is adapted to the extremes of climate found in the continental United States, as is not true of many grasses from western Europe.

The late Joseph E. Wing, of Mechanicsburg, Ohio, who perhaps did more than any other one man to introduce alfalfa east of the Mississippi River, was also a great bromegrass enthusiast. He used it on his farm, and 35 years ago gave advice concerning its use very similar to that given now.

Place of Bromegrass in Ohio

Bromegrass is the best grass to grow with alfalfa for pasture. For this purpose, it can be recommended for trial on any soil in Ohio that grows

Fig. 1.—Good alfalfa-bromegrass mixture.

really good alfalfa. It will outyield bluegrass as pasture, but its pasture value is so greatly increased by a legume mixture that it will hardly pay to sow it in pure culture. It cannot be recommended alone for hay. Bromegrass, grown alone, often becomes "sod-bound," that is, it ceases to produce many

seed heads and so is low-yielding. This so-called sod-bound condition is primarily due to lack of nitrogen and does not occur when it is grown in mixture with sufficient nitrogen-furnishing alfalfa. It will yield well for one year mixed with red clover, but the additional trouble and expense cannot be justified in comparison with the clover-timothy mixture. The alfalfa-bromegrass mixture for hay is more persistent than the alfalfa-timothy mixture on good soils, and is more palatable than the alfalfa-orchard grass mixture. Hence, it has some advantage where a long-lived meadow is especially important. Ladino clover (1 to 2 pounds per acre) is another good legume to use with bromegrass or the bromegrass-alfalfa mixture for pasture.

Characteristics and Uses

Bromegrass is a long-lived perennial. The strains generally used spread by underground rootstocks or "roots"; consequently, it makes a heavy sod well adapted to pasturing. It stands cold and drouth better than most grasses. Its drouth resistance is partly due to the fact that it is one of the deepest rooted cultivated grasses. Where the soil permits, its roots extend to a depth of 5 or 6 feet. It is a tall-growing, broad-leaved grass, reaching a height under ordinary Ohio conditions of 2 to 4 feet, or about the same height as timothy on the same soil. The hay is higher in protein than timothy at corresponding stages of growth.

Grows Through a Long Season.—Bromegrass starts early in the spring. It is in full bloom and ready to cut for hay during the second week in June in central Ohio. It will make considerable aftermath, even during the often dry weather of midsummer. At Columbus, it has repeatedly made a reasonable growth in dry Julys when the more common grasses made no growth at all. It also grows late in the fall.

Soils.—Bromegrass will grow on a wide variety of soils from sands to peats. Its outstanding requirement is an abundant supply of nitrogen in the soil. Since few soils furnish sufficient nitrogen to the crop, an accompanying legume to furnish nitrogen to the grass is a practical necessity in its profitable culture. Bromegrass should not be sown on soils which will not produce a good growth of alfalfa with it unless chemical nitrogen is applied to furnish the needed nitrogen.

Palatable as Hay or Pasture.—Despite its somewhat coarse growth, repeated demonstrations show bromegrass to be one of the more palatable grasses. Many tests of different grasses, both as hay and as pasture, even with animals which were not previously acquainted with this grass, have placed bromegrass high in the scale of palatability. It is more palatable than bluegrass as pasture. The leaves retain their green color and palatability after the seed is ripe, making it even possible to combine the seed and then cut a fair quality of hay.

Valuable for Seeding With Alfalfa.—Bromegrass makes an almost ideal mixture with alfalfa. It is long-lived, blooms at the same time as the first cutting of alfalfa, and endures the shade and frequent cutting incident to an alfalfa mixture better than timothy. For the first year or two the alfalfa-bromegrass mixture has yielded essentially the same as the alfalfa-timothy mixture, but bromegrass remains in the mixture for a longer period than timothy. With the use of adapted strains of bromegrass, alfalfa-bromegrass may outyield alfalfa-timothy.

Useful as Pasture with Alfalfa.—The greatest value of bromegrass lies in the possibility of growing it with alfalfa for pasture. The entire growth may be pastured or the first crop may be cut for hay and the second growth pastured until September. Compared to alfalfa alone, stock are less likely to bloat on this mixture, the mixture is usually more productive, and the soil is better protected from erosion and from puddling by tramping. The Michigan Agricultural Experiment Station reports that when bromegrass and alfalfa are pastured, the animals eat the two plants uniformly.

Value for Ditch Banks.—Bromegrass is one of the best grasses for drainage ditch banks. Its heavy sod keeps out weeds and prevents washing, and it is essentially permanent. A bank on the Ohio State University campus has been in bromegrass for more than a quarter-century and is still in good condition.

FIG. 2.—Variety test, Columbus, May 13, 1945. Left, Elsberry; right, Canadian. Average yield at first cutting—Elsberry, 6,380 pounds per acre; Canadian, 2,900 pounds per acre.

Varieties and Strains of Bromegrass

Until recently, no attention was paid to varieties or strains of bromegrass. Most of the commercial seed has come from Canada, North Dakota and Minnesota. Investigations in Nebraska, Kansas, Iowa and Missouri, as well as in Ohio, have shown that bromegrass from northern areas does not yield as well and is more susceptible to disease than strains grown for many seed generations in this latitude. The increases in yield of adapted bromegrass over Canadian in several tests in the last three years range from 10 to 30 per cent. At least four so-called "southern" strains of bromegrass are now offered: Achenbach from Kansas, Lincoln from Nebraska, Fischer from Iowa, and Elsberry, a selection developed in Missouri, by the Soil Conservation Service. Any of these are definitely superior to northern seed for any part of Ohio, especially the southern half. Seed produced in Ohio from Canadian seed is only slightly better than Canadian seed. Ohio farmers who wish to produce bromegrass seed should start with one of the above strains.

Experimental Backgrounds for Seeding Procedures

Previous slow acceptance of bromegrass is due in part to difficulties in seeding and obtaining stands. The seed is large, light and chaffy (Fig. 3), with a bushel weight of 14 to 20 pounds, and so is hard to sow with ordinary seeding equipment. To point out the reasons for some of the seeding procedures suggested later, the results of recent widely distributed experiments on seeding bromegrass in Ohio are given:

1. Mixing the bromegrass seed with fertilizer and sowing through the fertilizer attachment of the drill, or mixing with 4 to 6 times the weight of oats and sowing from the grain box of the drill are successful ways of distributing the seed. Even these mixtures should be frequently stirred to avoid separation or bridging over. The presence of bromegrass greatly reduces the rate of flow of the fertilizer or oats. A special wheelbarrow seeder with double chain feed distributes well-cleaned, pure, bromegrass seed well. There are also agitator attachments for some grain drills that make it possible to sow pure bromegrass from the grain box.

2. The best stands of alfalfa-brome mixtures have come from sowing alfalfa and bromegrass in late June, July or August, with no companion crop. Because of the danger of erosion, this is a risky method on sloping land.

3. Sowing bromegrass and legumes together with oats in the spring has given satisfactory stands in two-thirds to three-fourths of the trials—surpassed only by summer seeding without a companion crop.

4. Seeding bromegrass without a companion crop in early September has been very successful—so much so that legumes sown broadcast the next

spring in such seedings have often been unable to compete with the heavy growth of brome. (September is too late to sow legumes.)

5. Seeding bromegrass in wheat, as timothy is sown, has given satisfactory results in only one-fourth to one-third of the trials. The successful stands have come from the seedings made in wheat at the fly-safe date. Seedings made ten days or more later have always failed.

6. Seeding bromegrass in October without a companion crop has resulted in considerable to total winterkilling of seedlings.

7. Sowing about 4 pecks of spring oats with the bromegrass in the last half of September or early October has resulted in the seedlings living through the winter, and the bromegrass has not been so large as to smother legume seedlings the next spring. The oats are killed by freezing but serve as mulch. Fall seedings with oats made before September 15 may result in the oats smothering the bromegrass.

8. Bromegrass seed must be sown shallow—not over 1 inch deep, preferably somewhat less.

Methods of Seeding Smooth Bromegrass

A. *For Seeding in September:*

1. Drill deeply 300 pounds per acre of 4–12–8, 3–12–12, or 0–12–12 fertilizer on well-worked soil before sowing the seed. Smooth and firm the seedbed to insure uniform coverage of the seed.

2. Mix 10 pounds of bromegrass seed thoroughly with 150 pounds of the fertilizer for each acre to be seeded. Sow this mixture through the fertilizer hopper of the drill any time during the period September 10 to 30. The same drill adjustment used to apply the 300 pounds per acre of pure fertilizer will be about right for the 10 pounds brome–150 pounds fertilizer mixture. The bromegrass seed slows up the delivery of fertilizer about that

Fig. 3.—Bromegress seed, showing large flat chaffy seed.

much. (The bromegrass seed could be mixed with the entire amount of fertilizer, but mixing seed with 450 pounds per acre of fertilizer is *some task* and most of the fertilizer should be placed deeper than the seed.) Drill the seed-fertilizer mixture not deeper than ½ to 1 inch. It is best to take off the covering chains.

3. The following spring, sow 10 pounds of alfalfa per acre, or 8 pounds of alfalfa and 1 pound of ladino. Sow in March in southern Ohio, March 10 to April 10 in northern Ohio.

B. *Alternative method for seeding after September 10 (northern Ohio) to 20 (southern Ohio):*

As in "A," but at the same time the bromegrass-fertilizer mixture is sown sow 4 pecks of oats per acre through the oats feed. The oats will be winter-killed, but furnish some protection to the bromegrass seedlings. If sown after the wheat fly-safe date, this method is safer than "A." In the first half of September or earlier, this method may result in such a heavy growth of oats as to seriously damage the bromegrass seeding.

C. *Seeding in the spring:*

1. Disk the field as early as possible, to produce a layer of finely granulated soil on a firm rootbed. If weeds, previous crop, or excessive trash necessitates plowing, plow early, and work down to similar root and seedbed.

2. Mix thoroughly 10 pounds bromegrass and 60 pounds of clean seed oats for each acre. Sow the mixture through the oats feed. As the bromegrass seed slows up the delivery of mixture, the setting will need to be about 10 pecks of oats per acre. Apply 400 to 500 pounds per acre of fertilizer in the same operation. Use 0–12–12 or 0–20–10 where oats are apt to lodge. Use 3–12–12 or 5–10–10 where there is no danger of lodging the oats.

3. Sow the seed only ½ to 1 inch deep. Probably some of the oats and bromegrass seeds will not be covered, if the drill is set shallow enough to prevent too deep coverage. The legume seeds may be sown from the grass seed attachment at the same time or may be broadcast after seeding the oats-brome mixture. If the soil is dry, cultipack immediately after seeding.

D. *Seeding in June, July or August, without companion crop:*

As in "A," but sow legumes either from grass-seed attachment on the drill when sowing bromegrass, or broadcast immediately afterward. Cultipack at once after seeding. If the legumes are sown from the grass-seed attachment, use long delivery tubes which drop the seed *back* of the drill disks.

Bromegrass Seed Production in Ohio

Seed of bromegrass is readily produced in Ohio. The seed may be either combined when the seeds are dry ripe, or the field may be cut with a binder. The combine is much more satisfactory, because the lower leaves of bromegrass are still green when the seed is ripe. It is possible to follow behind with a mower and cut a fair quality of hay.

Nitrogen fertilization in large (100 to 200 pounds of ammonium nitrate per acre, or equivalent amounts of other nitrogen carriers) amounts is a practical necessity in obtaining satisfactory yields of bromegrass seed Yields of seed will be increased by nitrogen applications up to the point where the bromegrass lodges. They are best made the fall before, or very early (before April 10) in the spring.

Yields of seed will range from 200 to 500 pounds per acre. Combined seed is almost never dry enough to store, and must be spread thin, or artificially dried The seed must be recleaned to sow satisfactorily, and is difficult to clean.